EXHIBIT C

PG 1

($)

ARD ACCUMULATED RETURN DEFICIENCY STUDY

CUMULATIVE RETURN DEFICIENCY/(SURPLUS) PER BASIC SUBSCRIBER BY CALENDAR YEAR BY SYSTEM

System	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	MAX ARD PER SUB	YEAR OF MAX ARD PER SUB
1	19	56	90	112	95	60	20					112	1986
2	272	248	282	335	311	325	376	410	446	481	521	521	1993
3	351	400	466	527	573	578	124	77	39			578	1988
4			157	205	329	415	480	553	625	695	744	744	1993
5	255	305	358	393	403	416	380	378	362	323	280	416	1988
6	373	470	606	729	814	942	981	1,048	1131	1,233	1,294	1,294	1993
7	351	468	593	697	808	908	1,030	1,093	1172	1,232	1,305	1,305	1993
8	223	258	346	377	402	421	416	395	357	306	248	421	1993
9	347	400	447	501	547	579	579	566	570	555	550	579	1989
10	332	484	635	762	858	963	1,053	1,156	1233	1,322	1,479	1,479	1993
11							227	41	85	136	169	227	1989
12	206	179	228	276	318	355	383	413	428	549	383	549	1992
13	230	234	260	261	204	206	205	178	144	139	116	302	1982
14	358	407	536	402	441	493	495	478	444	401	333	536	1985
15	17	4										27	1982
16	247	256	267	248	223	189	149	111	67	20		267	1985
17	188	291	363	419	463	493	536	582	615	654	693	693	1993
18	221	348	377	409	452	470	482	495	486	469	449	495	1990
19	10	62	79	104	126	140	143	131	98	26		143	1989
20	148	201	291	365	438	509	578	644	710	751	768	768	1993
21				106	122	180	205	230	258	227	180	258	1991
22		111	76	149	140	120	75	5				149	1988
23						970	669	625	591	562	468	970	1988
24	209	266	531	740	885	989	1,106	1,221	1367	1,467	1,543	1,543	1993
25	22											29	1982
26					456	371	299	382	498	694	828	828	1987
27				152	238	295	340	388	399	408	385	408	1992
28								184	389	590	749	749	1993
29				13	109	188	230	342	414	458	493	493	1993
30	128	130	145	129	87	34						145	1985
31	167	179	183	170	139	87	20					183	1985
32	111	141	161	151	126	91	49					161	1985
33	48	14										144	1979
34	130	72	35	15								503	1979
35		110	120	131	148	159	157	128	82	47	27	159	1989
36	344	531	874	1,221	1,534	1,970	2,333	2,634	2950	3,242	3,667	3,667	1993
37	140	149	150	146	119	92	49					150	1985
38												116	1972
39												37	1972
40	146	125	94	43								355	1976
41	79	82	68	38								115	1978
AVERAGE	196	233	304	323	397	452	457	532	591	653	736	552	1987
INFLATION ADJUSTED	263	304	385	397	474	524	514	581	627	673	736		

KANE REECE ASSOCIATES, INC.

EXHIBIT C

PG 2

ARD ACCUMULATED RETURN DEFICIENCY STUDY
CUMULATIVE RETURN DEFICIENCY/(SURPLUS) PER BASIC SUBSCRIBER BY CALENDAR YEAR BY SYSTEM

System	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
1												57
2												18
3										153	202	286
4												
5											178	180
6										765	181	272
7										443	643	258
8												
9											154	268
10												240
11												
12												
13											168	302
14												517
15									10	14	27	27
16										150	156	196
17												213
18										90	95	134
19												
20												
21												
22												
23												
24												
25												29
26												
27												
28												
29												
30							111	137	140	125	114	131
31											68	121
32											64	79
33									144	92	74	77
34									503	391	313	187
35												
36												49
37												
38	105	116	97	101	100	93	70	54	18			
39	37	33	12									
40		157	196	294	321	355	229	263	176	178	173	161
41					59	98	115	115	112	105	92	80
AVERAGE	71	102	102	198	160	182	131	142	157	228	169	169
INFLATION	136	190	184	347	273	301	210	222	238	335	241	234

KANE REECE ASSOCIATES, INC.

EXHIBIT D

Analysis of Intangible Assets as Percentage of Hypothetical Sale Price and "Regulated" ARD Values as a percentage of those Intangible Values

- Provides a summary level look at the System sample using an average ten times operating cash flow multiple as a proxy for system sale price at the end of 1993.
- Does a "sensitivity" check on the implied per subscriber sale multiple .
- Determines the implied intangible assets represented in the hypothetical sales price by subtracting the net book tangible plant and equipment assets at year end 1993 (average is 71%).
- Allocates the implied intangible assets to regulated services based on each system's 1993 regulated channel percentage.
- Calculates the 1993 cumulative ARD as a percentage of this regulated intangible asset value, the implication being that the ARD translates into the intangible asset.

ARD ACCUMULATED RETURN DEFICIENCY STUDY **EXHIBIT D**
ANALYSIS OF 1993 INTANGIBLE ASSETS AS % OF HYPOTHETICAL SALE PRICE
AND "REGULATED" ARD VALUES AS A % OF THOSE INTANGIBLE VALUES

System	EOY 1993($) ESTIMATED SYST SALES PRICE @ 10 x OP CF	IMPL. PER SUB PRICE	EOY 1993($) TANG NET PLNT & EQPMT	IMPLIED TOTAL INTANG. ASSETS	IMPLIED PERCENT INTANGIBL	IMPLIED REG'LD INTANG. ASSETS	1993 POSITIVE ARD SYTEMS AS % OF REG'D INTANG ASSETS
1	37,823,586	2,114	5,566,278	32,257,309	85%	26,612,280	N/A
2	132,010,456	1,700	41,054,178	90,956,279	69%	75,857,536	53%
3	21,625,780	1,120	2,814,312	18,811,468	87%	15,162,043	N/A
4	73,740,360	1,567	32,839,554	40,900,806	55%	34,315,776	102%
5	54,747,712	1,854	7,904,706	46,843,005	86%	42,158,705	20%
6	17,890,640	1,883	2,560,388	15,330,252	86%	13,751,236	89%
7	42,804,167	1,750	9,478,971	33,325,196	78%	29,992,676	106%
8	24,332,640	1,608	5,163,011	19,169,629	79%	16,088,796	66%
9	12,568,740	1,446	795,594	11,773,146	94%	10,219,091	47%
10	41,596,516	1,731	9,774,201	31,822,315	77%	28,671,906	124%
11	6,666,190	1,830	3,848,626	2,817,564	42%	2,276,592	27%
12	94,806,910	2,198	21,343,714	73,463,196	77%	63,435,470	26%
13	42,307,210	1,297	14,608,635	27,698,575	65%	22,546,640	17%
14	104,195,560	2,433	19,923,383	84,272,177	81%	66,322,203	22%
15	113,650,360	1,734	50,170,469	63,479,891	56%	52,370,910	N/A
16	160,164,430	1,981	39,750,408	120,414,022	75%	105,362,269	N/A
17	42,588,140	1,656	17,223,994	25,364,146	60%	22,396,541	80%
18	77,693,810	1,849	13,113,469	64,580,341	83%	56,507,799	33%
19	70,426,580	2,170	15,384,046	55,042,534	78%	45,685,303	N/A
20	85,866,930	2,146	23,640,873	62,226,057	72%	49,780,846	62%
21	307,960,000	1,931	43,782,000	264,178,000	86%	218,517,605	13%
22	11,048,120	2,550	4,939,625	6,108,495	55%	4,772,262	N/A
23	169,618,550	796	193,154,437	(23,535,887)	-14%	(18,201,086)	N/A
24	148,160,030	1,152	38,897,000	109,263,030	74%	71,738,353	423%
25	26,501,560	1,556	1,112,922	25,388,638	96%	22,567,678	N/A
26	109,882,200	1,913	34,978,800	74,903,400	68%	63,917,568	74%
27	108,008,550	2,122	14,932,540	93,076,010	86%	78,063,750	25%
28	1,822,570	1,623	965,065	857,505	47%	719,198	117%
29	116,714,820	1,513	45,177,041	71,537,779	61%	60,883,216	62%
30	20,442,790	1,115	9,525,016	10,917,774	53%	8,932,724	N/A
31	5,872,460	1,495	2,349,094	3,523,366	60%	2,882,754	N/A
32	6,371,410	1,603	3,395,398	2,976,012	47%	2,434,919	N/A
33	75,824,140	1,803	20,587,538	55,236,602	73%	47,009,874	N/A
34	54,699,900	1,697	10,802,654	43,897,246	80%	35,915,929	N/A
35	90,534,250	1,912	42,569,789	47,964,461	53%	39,500,144	3%
36	66,255,630	1,140	29,970,565	36,285,065	55%	31,603,121	674%
37	61,976,572	1,385	10,195,995	51,780,577	84%	44,719,590	N/A
38	37,343,310	2,057	2,404,345	34,938,965	94%	27,077,698	N/A
39	87,510,890	2,050	3,722,178	83,788,712	96%	67,543,962	N/A
40	137,130,000	2,020	9,752,494	127,377,506	93%	99,416,590	N/A
41	32,656,410	1,403	4,071,175	28,585,235	88%	23,267,052	N/A
TOTAL($000)	2,933,841		864,244	2,069,596			
AVERAGE	71,557	1,729	21,079	50,478	71%		99%

KANE REECE ASSOCIATES, INC.

EXHIBIT E

Basic Subscriber Year End Counts by System

ARD ACCUMULATED RETURN DEFICIENCY STUDY
BASIC SUBSCRIBER END OF YEAR COUNTS

System	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
1	14,370	14,167	14,383	15,311	16,500	16,773	17,283	17,548	17,696	17,896
2	33,282	40,741	44,776	57,055	64,650	65,802	69,916	72,927	75,276	77,662
3	3,727	3,653	3,605	3,625	3,740	13,727	16,530	17,958	18,668	19,306
4		16,912	41,083	42,031	43,498	45,894	46,332	45,944	46,612	47,063
5	20,025	20,841	22,244	24,186	25,538	26,962	27,652	28,330	28,891	29,533
6	8,735	8,405	8,548	9,096	9,063	9,301	9,544	9,599	9,499	9,500
7	19,774	19,645	20,399	21,102	21,684	22,719	23,307	23,537	24,115	24,454
8	10,165	10,960	11,746	12,590	13,243	13,878	14,112	14,441	14,867	15,133
9	6,430	6,597	6,801	6,974	7,161	7,622	8,146	8,201	8,590	8,692
10	18,044	17,909	18,482	19,650	20,628	21,734	22,365	23,461	24,402	24,034
11						227	2,354	3,202	3,419	3,642
12	13,723	21,330	28,473	33,060	35,687	38,192	39,816	40,698	31,609	43,137
13	13,971	16,819	17,933	26,251	27,652	28,542	30,402	31,169	32,147	32,608
14	17,989	19,967	32,391	34,316	36,216	38,172	39,530	41,050	42,270	42,824
15	46,122	48,529	51,900	54,044	56,194	59,493	61,956	64,731	65,264	65,560
16	41,875	46,000	50,052	54,223	59,489	64,261	68,704	72,073	76,298	80,857
17	11,365	12,801	14,476	16,114	17,830	19,377	20,734	22,629	24,285	25,712
18	30,683	33,755	36,150	36,998	38,446	39,444	39,851	40,763	41,266	42,012
19	11,525	23,138	25,093	26,894	28,880	29,984	31,013	31,430	32,148	32,454
20	28,270	34,875	36,659	38,251	39,849	40,274	40,780	40,219	39,934	40,021
21			4,306	48,038	89,780	125,916	144,614	147,492	154,193	159,477
22	833	2,337	2,457	2,983	3,192	3,373	3,863	4,074	4,178	4,333
23					5,533	22,281	46,236	83,338	134,191	212,977
24	68,637	72,687	79,038	88,324	98,888	105,454	112,378	115,460	122,257	128,659
25	14,114	14,698	15,121	15,876	16,426	17,043	17,447	17,571	17,601	17,035
26				2,500	16,017	41,960	52,526	59,635	55,872	57,451
27		31,244	37,471	40,215	42,944	44,830	45,543	47,727	48,855	50,908
28							944	1,045	1,080	1,123
29			14,384	17,309	34,868	52,340	60,039	69,248	73,694	77,133
30	15,342	16,110	16,513	16,998	17,136	17,645	18,039	18,233	18,378	18,331
31	2,558	2,688	2,872	2,955	3,196	3,303	3,432	3,514	3,994	3,927
32	2,471	2,594	2,797	2,925	3,147	3,149	3,258	3,368	3,733	3,975
33	21,583	23,111	26,092	28,246	32,467	33,359	36,175	37,805	41,089	42,054
34	10,237	12,549	15,679	20,730	22,652	24,859	27,227	29,097	30,472	32,224
35	10,902	21,803	24,755	28,091	32,082	35,322	38,715	42,464	46,157	47,355
36	49,940	48,960	49,542	51,833	50,823	52,013	54,283	55,811	57,980	58,116
37	38,984	40,434	41,552	42,730	44,488	44,412	44,249	43,986	44,115	44,752
38	14,327	14,612	15,162	15,859	16,638	16,914	17,651	17,816	17,845	18,153
39	38,085	38,573	39,256	40,115	40,583	40,762	41,373	41,314	41,992	42,680
40	59,924	62,834	63,337	64,987	66,178	66,902	67,094	67,399	67,206	67,878
41	15,840	16,327	17,395	18,182	19,213	19,819	20,525	21,690	22,641	23,271
TOTAL	713,851	838,605	952,923	1,080,667	1,224,199	1,374,034	1,485,938	1,577,997	1,664,779	1,793,912
AVG	21,632	23,960	25,755	28,439	31,390	34,351	36,242	38,488	40,604	43,754

ARD ACCUMULATED RETURN DEFICIENCY STUDY
BASIC SUBSCRIBER END OF YEAR COUNTS

System	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
1													7,795	14,115
2													15,000	22,500
3											3,080	3,583	3,585	3,757
4														
5											119	8,539	17,642	18,578
6											533	6,421	8,022	8,603
7											2,299	2,994	16,348	18,729
8														6,349
9												5,670	5,722	6,232
10													8,025	16,270
11														
12														3,991
13												4,572	5,542	10,875
14												198	4,951	12,969
15										20,500	23,871	29,597	40,275	43,245
16										5,913	18,100	30,168	34,150	36,644
17													2,459	9,644
18											2,856	18,244	32,004	33,201
19														5,763
20														16,162
21														
22														11
23														
24													21	27,578
25													13,266	13,522
26														
27														
28														
29														
30								3,000	5,000	7,424	9,941	11,180	12,278	14,437
31										0	0	1,300	1,901	2,412
32										0	0	1,000	2,061	2,394
33										3,662	9,037	13,168	12,850	16,126
34										2,095	2,931	3,807	5,649	7,604
35														
36													17,837	35,673
37													0	36,956
38		7,010	7,931	9,627	9,223	9,344	9,466	11,065	11,249	11,617	12,049	12,601	13,828	14,100
39		16,753	18,448	23,601	22,414	24,066	25,759	27,891	29,197	30,340	31,419	32,950	36,465	37,703
40			12,657	14,277	12,068	12,616	13,011	24,474	25,158	43,678	45,246	46,599	52,790	56,805
41						7,944	8,781	9,863	10,982	11,810	12,796	13,746	14,691	15,693
TOTAL		23,763	39,036	47,505	43,705	53,970	57,017	76,293	81,586	137,038	174,277	246,337	385,157	568,641
AVG		11,882	13,012	15,835	14,568	13,493	14,254	15,259	16,317	12,458	10,892	12,965	14,265	17,770

EXHIBIT F

Cable Television Companies Participating in the ARD Study

Include Those Listed on the Following Exhibit

EXHIBIT F

Benchmark Communications

Bresnan Communications Company

Cablevision Industries Corporation

Cablevision Systems Corporation

Century Communications Corporation

Continental Cablevision, Inc.

Greater Media, Inc.

Houston Industries/KBLCOM

Lenfest Communications, Inc.

Viacom Cable

Western Communications

QUALIFICATIONS OF THE ANALYSTS

STATEMENT OF BACKGROUND AND EXPERIENCE

Robert E. Ott CFA

Robert E. Ott is a Principal of Kane Reece Associates, Inc. Mr. Ott joined the Firm in February 1988. In addition to providing fair market value opinions, purchase price allocations, due diligence support, and state and local tax compliance services, Mr. Ott is responsible for providing rate regulation analysis, compliance and cost of service support to the cable TV industry. He is experienced in valuing both tangible and intangible assets in businesses such as cable television, cellular/paging, broadcast radio and television stations, and telecommunications business, and has served as a valuation and communications industry expert, providing testimony, advice and litigation support. Additionally, he has provided management consulting services to numerous media industry clients ranging from turn-around evaluations to service pricing strategy and rate base compliance services.

Mr. Ott has developed hands-on experience with the 1992 Cable Act regulations, in particular the rate regulation benchmark analysis and proposed cost of service regulations. He has experience in the development of computer models to assist in the compliance with FCC Form 393 and his background includes responsibility for determining various FCC regulated telecommunication services' rates and providing corresponding cost of service support for FCC tariff filings.

Prior to his current position, Mr. Ott was Vice President and Chief Financial Officer for Satellite Business Network, Inc. (SBN). Prior to SBN, Mr. Ott spent over eleven years with RCA Corporation in both line and staff roles involving technology oriented business. There he last served as Chief Financial Officer for a telecommunications service subsidiary where he was responsible for the accounting, financial analysis, MIS, and purchasing functions. Mr. Ott began his RCA career in 1976 with the start-up of the domestic satellite carrier, RCA Americom. Mr. Ott is experienced in developing business, marketing, and strategic plans, and the implementation and/or acquisition of new businesses. He has extensive experience in managing and controlling fixed assets in capital intensive businesses.

Previous experience includes two years in the semi-conductor industry with Burroughs Corp. (UNISYS) and Mr. Ott served as an officer in the US Naval Submarine Force, specializing in the electronics/intelligence field.

Mr. Ott received an undergraduate degree in electrical engineering from Villanova University and a Masters of Business Administration from the University of Connecticut. He was elected a member of Tau Beta Pi, Eta Kappa Nu, and Beta Gamma Sigma, Engineering and Business Honor Societies. Mr. Ott is a member of the Institute of Chartered Financial Analysts (CFA), the Association for Investment Management and Research, and The New York Society of Security Analysts. Mr. Ott is a member of The Broadcast Cable Financial Management Association, and the Personal Communications Industry Association.

He recently served on the board of Trustees and as Treasurer for Rutgers Preparatory School in Somerset, New Jersey.

STATEMENT OF BACKGROUND AND EXPERIENCE

Henry E. Sherman CFA, CPA

Henry E. Sherman is a Vice President at Kane Reece Associates, Inc. Mr. Sherman joined the Firm in June 1988.

Mr. Sherman is responsible for providing rate base and cost of service support to cable television systems and the analysis and evaluation of business operations for determining fair market value of closely held and public corporations, purchase price allocations, due diligence support, and solvency and fairness opinions. Mr. Sherman is experienced in valuing business interests and intangible and tangible assets in the media industry.

Prior to his current position, Mr. Sherman was a Senior Consultant with Standard Research Consultants in New York City. While at Standard Research, he was responsible for all solvency letters and fairness opinions. Previous to employment at Standard Research, Mr. Sherman was a Supervising Appraiser at Valuation Research Corporation where he had responsibility for clients in a broad range of industries.

Mr. Sherman is experienced in dealing with a regulatory environment, as well as providing the accounting and financial expertise necessary to accurately present and defend financial and operational filings. For the last decade, Mr. Sherman has been a consultant to the cable television industry in the areas of financial planning and analysis and rate planning. Specific rate base experience includes serving as manager in the rate increase department (rate increases were regulated at that time) at Teleprompter, at that time the nation's largest MSO, with over 140 systems in 40 states. In 1979, rate increases constituted 25 million dollars (15% of total company revenue) in incremental revenue to the company.

Mr. Sherman has been involved in the cable industry for over fourteen years, beginning as Manager of Business Analysis at Group W Cable (Teleprompter) where he had responsibility in the areas of acquisitions, divestitures, and capital expenditure analysis.

Mr. Sherman received an undergraduate degree from Johnston College of the University of Redlands and an M.B.A. from the Bernard Baruch College of the City University of New York. Mr. Sherman is a member of The Institute of Chartered Financial Analysts (CFA), a Certified Public Accountant (CPA), a member of The American Institute of Certified Public Accountants, a member of The New York State Society of Certified Public Accountants, and a member of The New York Society of Security Analysts.

STATEMENT OF BACKGROUND AND EXPERIENCE

David K. Bivins PhD

David K. Bivins is a Senior Consultant at Kane Reece Associates, Inc. Dr. Bivins joined the Firm in February 1993. His expertise is in financial and intangible asset valuations and in operations and marketing research. His current assignments with Kane Reece include valuation of television station syndicated program rights and working with several Cable Advertising Interconnects on pricing and inventory use, market share, and television revenue share analyses.

Prior to his current position, Dr. Bivins had his own practice, DKB Consulting, specializing in business planning and development. Prior to this he spent 17 years with National Broadcasting Company (NBC) in New York. While at NBC, he served as a Senior Systems Analyst, Manager and Director of Pricing, Director of Financial Forecasting, and Vice President of Finance and Administration for the NBC Television Network. The NBC TV Network sells over $3 billion in commercial time annually and (through its 210 affiliates) distributes programming for NBC.

Preceding his NBC experience, Dr. Bivins held analyst positions at Mathematica, Inc. and Abt Associates where he developed production planning systems for Olivetti and participated in the economic analysis of the NASA Space Shuttle, as well as other complex projects.

Dr. Bivins received his doctorate in 1969 from Massachusetts Institute of Technology (MIT) in Operations Research, focusing on mathematical programming, facilities location, and transportation/distribution networks. He received his M.S. in Civil Engineering and his B.S. in Mathematics, also from MIT.

Dr. Bivins has lectured and qualified as an expert witness in a number of intangible asset issues involving cable, broadcast, and print media. His expertise is in media intangibles valuation, with particular strength in valuing advertiser/customer/subscriber relationships, network affiliations, and program rights.

He is a member of the Broadcast Financial Management Association and the MIT Clubs of New York and Princeton. Dr. Bivins is a candidate for designation in the Business Valuation section of the American Society of Appraisers (ASA).

STATEMENT OF BACKGROUND AND EXPERIENCE

Norval D. Reece

Norval D. Reece is a Principal of Kane Reece Associates, Inc., a Firm he co-founded in 1986.

Mr. Reece is on the Board of Directors of the National Cable Television Association CablePac, a member of the 1995 NCTA Convention Committe, and is active in cable television industry affairs. He was a founding Board member of C-Span, the public affairs cable network, a long-term advisor to The Learning Channel, a member of the NCTA State and Local Affairs Committee for ten years, and previously served on the NCTA Public Policy Committee that helped draft the Cable Policy Act of 1984. Mr. Reece is a frequent speaker at conventions and seminars, including ones sponsored by The Edison Institute, The Kennedy Institute at Harvard, The University of California, The University of Wisconsin, the NCTA, the National League of Cities, and the Inter-Republic Association of Independent Broadcasters in Novgorod, Russia.

Mr. Reece formerly served as Vice President of Corporate Affairs, Group W Cable, Inc., Westinghouse Broadcasting. While at Group W Cable, Mr. Reece was a member of the Senior Management Team, which doubled the company's size and increased gross margins by 30% in four years. He served as Chairman of the Steering Committee of Group W Cable, that implemented the sale of the $2.1 billion cable television company in 1986.

Previously, Mr. Reece was Vice President New Markets Development for Teleprompter Corporation, then the largest cable company in the United States. He developed the master plan for the expansion of Teleprompter/Group W Cable and established one of the most successful franchising programs in the industry.

Mr. Reece was Secretary of Commerce of the Commonwealth of Pennsylvania and Special Assistant to the Governor from 1971 to 1979. He was founder and Chairman of Pennsylvania's first Small Business Commission, founder and Chairman of its first Film Commission for on-site movie production, founder and Chairman of the Northeast Association of State Commerce Officials, and established new trade offices in Japan, Europe and South America.

Mr. Reece is former Chairman of the National Governors' Association Task Force on Commerce, Transportation, and Technology. He has been a Delegate to President Carter's White House Conference on Economic Development, a Delegate to President Bush's White House Conference on Eastern Europe, and has led trade missions to various countries in Europe and Asia. He served as Chairman of the Pennsylvania Industrial Development Authority and has been on more than seventy Boards and Commissions.

Mr. Reece is currently Chairman of the Board of Directors of Lenceltel, a joint venture in St. Petersburg, Russia for cellular telephony and cable television. Mr. Reece previously was Chairman of the Board of Polska Telewizja Kablowa, the joint venture in Warsaw, Poland, that pioneered in developing the rights to cable television for the country of Poland, and is currently operating cable systems in the four major cities of that country.

Mr. Reece holds a Bachelor of Arts Degree from DePauw University and a Masters Degree from Yale University. Active in community affairs, he has been a member of his local Cable Television Advisory Board, a member of the Newtown Friends School Board, currently serves as Trustee and Chairman of the Finance Committee of Newtown Friends Meeting, and serves as Co-Chairman of the George School Annual Fund.

Attachment 2:
The Brattle Group Reply

RATE OF RETURN RECOMMENDATIONS IN CABLE COST OF SERVICE REGULATION: A REPLY STATEMENT

Prepared by

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December 1994

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RATE OF RETURN RECOMMENDATIONS IN CABLE TELEVISION COST-OF-SERVICE REGULATION: A REPLY STATEMENT

I. INTRODUCTION AND SUMMARY

A. Background

In July 1994 The Brattle Group ("Brattle") prepared a report responding to the Commission's March 30, 1994 request for additional information regarding what reasonable overall rate of return to use in its cable cost-of-service rules.[1] The report was attached to the comments made by Continental Cablevision, and other cable operators and associations jointly filing comments in response to this and other issues raised by the Commission's March 30 Order. Reply statements to these comments were received by the Commission on August 1, 1994. Among these reply comments was the Affidavit of James H. Vander Weide.[2]

The numerous inaccurate statements made by Dr. Vander Weide regarding Brattle's study call for a careful and complete response. Overall, Dr. Vander Weide's claims are without merit and unsupported by financial theory or the evidence. Moreover, we show that the simple correction of two erroneous inputs used in Dr. Vander Weide's own recommended methodology yields an overall rate of return for the cable industry in excess of the 13.0 percent Brattle recommended in its July 1994 report[3].

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[1] In the matter of Implementation of Sections of the Cable Television Consumer Protection and Competition Act of 1992, *Report and Order and Further Notice of Proposed Rulemaking*, MM Docket 93-215, FCC 04-39, released March 30, 1994, (Cost-of-Service Order).

[2] Affidavit of James H. Vander Weide in Support of Reply Comments of Bell Atlantic filed on August 1, 1994 in MM Docket No. 93-215.

[3] Dr. Vander Weide incorrectly states in his affidavit that Brattle recommended an overall rate of return of 13.1 percent. It is not clear where Dr. Vander Weide obtains this number. Brattle explicitly states a recommendation of 13.0 percent at several places in its report, *e.g.* see pg. 8 and pg. 51.

This reply statement was prepared by A. Lawrence Kolbe, assisted by Lynda S. Borucki. Dr. Kolbe holds a Ph.D. in Economics from the Massachusetts Institute of Technology and a B.S. in International Affairs (Economics) from the U.S. Air Force Academy. Dr. Kolbe has over 15 years of experience with cost-of-service regulation, much of it focused on rate of return issues. Dr. Borucki has worked on the cost of capital and related issues with Dr. Kolbe and with Professor Stewart C. Myers of MIT (also a member of Brattle) in a number of previous matters. Dr. Borucki holds a Ph.D. in Managerial Economics and Decision Sciences from the Kellogg Graduate School of Management, Northwestern University.

B. The Brattle Group Has Not Misapplied Its Own Methodology

Dr. Vander Weide claims that Brattle misapplied its own methodology in several respects. As discussed below, Brattle has correctly implemented the methodology and supported the inputs to its calculations. Brattle has not overstated the cable industry's overall cost of capital nor its cost of equity.

Adjusted Beta. Dr. Vander Weide claims that the beta estimate Brattle used in the Capital Asset Pricing Model ("CAPM") is an overestimate of the true beta. He argues that the Brattle estimate should be adjusted downward towards one. There is no consensus among financial analysts regarding the need for this adjustment, so the burden of demonstrating that it should be applied in this case fairly rests on him. He has failed to meet that burden. His adjustment is based on the *a priori* belief that the true beta for the cable industry is 1.0. Here, Dr. Vander Weide has provided no evidence to support this assumption, so his reasoning is circular: he has simply assumed what is fairly his obligation to prove or, at the least, to support with objective evidence. In fact, the evidence provided by Brattle shows that the true beta is much greater than 1.0, and moreover, that it is digressing from 1.0. These facts invalidate the assumption Dr. Vander Weide makes.

Debt Beta. Dr. Vander Weide claims that Brattle applied its beta levering formula incorrectly, claiming that the debt beta should be equal to zero in this calculation. He

provides no evidence to support this assumption. To the contrary, we provide evidence (again) to show that the beta of corporate debt is in fact non-zero. It is in the range of 0.25 for "High Grade" debt and in the range of 0.45 for the debt of cable service companies.

Embedded Cost of Debt. Dr. Vander Weide claims that Brattle should have used the embedded cost of debt instead of the market based cost of debt employed by the Brattle Group. Correct application of Brattle's methodology in light of its theoretical basis specifically requires the use of the cost of debt in the market. Nevertheless, for our sample of companies the average embedded cost of debt is 9.7 percent, only slightly lower than the average current market yield of 10.1 percent. Dr. Vander Weide's embedded cost of debt of 8.31 percent is actually a downward biased estimate of the average embedded cost of debt.

Book vs. Market Capital Structure Weights. Dr. Vander Weide argues that Brattle should have used book weights to calculate the overall rate of return for the cable industry. Leading finance textbooks clearly state that these values should be market values. Further, since half of the companies in Brattle's sample have negative net worth, a book calculation would be meaningless.

Constant Cost of Capital. Dr. Vander Weide criticizes the constant cost of capital assumption employed by Brattle in its analysis. He never explains, however, how Brattle's reasonable simplifying assumption affects the result of our analysis, nor does he propose an alternative relationship between capital structure and cost of capital. This assumption is reasonable and practical to implement. In fact, two Nobel prizes have been awarded in part for the results on which we rely. We also show that Dr. Vander Weide's criticism of this assumption contradicts his stated agreement with the beta formulas we employ.

Risk-Free Rate. Dr. Vander Weide recommends use of a long-term interest rate as the risk-free rate and the corresponding long-term risk premium as inputs into the CAPM model, instead of Brattle's short-term risk-free rate and corresponding market risk premium. The risk-free rate is clearly defined as the expected return on an investment that has no risk.

Yields on long-term government bonds include compensation for the risks of unexpected changes in the underlying real interest rates and uncertainty as to the level of inflation. Thus, it is not appropriate to use the long-term rate as the risk-free rate.

In addition to criticizing Brattle's use of the short-term rate as the risk-free rate, Dr. Vander Weide also criticizes our estimate of the short-term rate. He recommends use of the contemporaneous short-term rate instead of the forecasted rate obtained by Brattle as the risk-free rate in the CAPM model. Dr. Vander Weide's recommendation results in biased cost of equity estimates. In the current environment of rising interest rates, Dr. Vander Weide's method results in an *underestimate* of the CAPM cost of equity.

C. The Brattle Group's Methodology Provides Results Consistent with the Commission's Traditional Methodology

Dr. Vander Weide also faults Brattle for using a methodology inconsistent with the Commission's traditional methodology. Aside from the Discounted Cash Flow ("DCF") versus Risk Positioning debate, addressed elsewhere,[4] at issue is the method of calculating the weighted average cost of capital ("WACC"). The Commission traditionally calculates the WACC by averaging the cost of equity and the embedded cost of debt, using book-value weights. Brattle estimated the cost of equity at the observed capital structure and from this estimate obtained the all-equity cost of capital. The all-equity cost of capital, by construction, corresponds to the traditional regulatory WACC.

The theoretical and practical benefit of Brattle's method is that it automatically reflects the impact of different capital structures on the cost of equity. It also eliminates the need to estimate a generic embedded cost of debt for this highly diverse industry. However, in this reply statement we have calculated the regulatory WACC in the traditional fashion to prove that our overall cost of capital estimate is not biased. Our estimates show that under all reasonable scenarios our recommendation of 13.0 percent is lower than any WACC estimate

[4] See for example pp. 3-4 and pp. 11-17 of Brattle's July 1994 Report.

obtained via the traditional method. This should provide comfort to the Commission that Brattle's method does not provide upward biased estimates of the weighted average cost of capital.

D. The Commission Faces a Difficult Task in Sorting Through the Issues

Dr. Vander Weide's affidavit raised several issues that the Commission may feel it now needs to ponder. Brattle has made an effort in this paper to address each of those points, providing hard evidence to illustrate that Brattle's analysis is supported by the academic literature and correct in its implementation. Thus we stand by our analysis and recommendation of an overall cost of capital of at least 13.0 percent for the cable service industry. Nevertheless, the Commission may feel bound by previous actions, such as the use of book values in the calculation of the weighted average cost of capital, and thus swayed to accept the rest of Dr. Vander Weide's recommendations.

Under no circumstances should the Commission adopt this approach. Even within the context of Dr. Vander Weide's approach, simple substitution of the factually-supported, unadjusted equity betas and positive debt betas into Dr. Vander Weide's calculations yields an overall cost of capital for the cable industry of 13.2 percent. Brattle provides empirical evidence in this paper that unadjusted equity betas and positive debt betas are the correct parameters to use in the model. Further, substitution of a cost of debt of 8.5 percent, the value recommended by the Commission in the Cost of Service Order,[5] yields a slightly higher overall cost of capital of 13.3 percent.

Even if one unequivocally accepts Dr. Vander Weide's recommendations regarding methodology, we show that the average embedded cost of debt for his sample of companies is actually 9.2 percent, and could be as high as 9.7 percent when an outlier is removed from the sample. Dr. Vander Weide's estimate of the overall cost of capital increases from 11.83

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[5] Cost of Service Order at ¶ 190.

percent to 12.3, or even as high as 12.5 percent, when the cost of debt is replaced with these unbiased estimates of the embedded cost of debt.

Combining the correction for the embedded cost of debt with positive debt betas increases Dr. Vander Weide's estimate from 11.83 percent to 13.1 to 13.3 percent. Finally, substitution of the unadjusted betas for Dr. Vander Weide's underestimated adjusted betas yields overall cost of capital estimates of 13.6 to 13.9 percent. These estimates lend further support to the conservative recommendation made by Brattle.

E. Dr. Vander Weide's Estimate of 9.38% for the Cable Industry Cost of Capital is Unreasonable.

Dr. Vander Weide's claims that the cable companies' average cost of capital is now 9.38% is absurd on its face. The majority of cable companies in the Brattle sample (which consists of all the publicly traded cable companies with revenue from cable service exceeding 60 percent) have an S&P bond rating of B. The September average industrial bond yield reported by S&P for a B rating is 11.49%. The September average bond yield for BB bond ratings is 9.89% and for BBB bond ratings is 9.27%. Dr. Vander Weide is recommending a cost of capital for cable companies that is comparable to the yield on an industrial bond with a BB or BBB debt rating.

Moreover, Dr. Vander Weide's use of the cost of equity from the third quartile of the S&P 400 is unjustified. Dr. Vander Weide has never provided any analysis to support his claim that the cost of equity from the third quartile is an appropriate approximation of the cost of equity for cable companies at their actual capital structure, or any capital structure.[6] Moreover, in its July 1994 Report, Brattle provided extensive evidence to the contrary. That evidence shows that the Commission should look to the *fourth* quartile of the S&P 400 for the cost of *equity* for cable companies at a 50/50 capital structure. Alternatively, the *overall*

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[6] He first makes this assertion in an affidavit filed on August 25, 1993 in support of the *Joint Comments of Bell Atlantic, et. al.* in MM Docket No. 93-215. See paragraph 20.

cost of capital for the cable industry is comparable to the third quartile of the S&P 400. We urge the Commission to examine carefully the evidence provided by Brattle linking the cost of capital for cable companies to the S&P 400 if it still finds it necessary to rely on a surrogate group.

Finally, Dr. Vander Weide argues for regulatory "parity" between cable companies and telephone companies. Putting aside the speciousness of the claim that there is anything "unfair" about treating industries as different as cable and telephone differently, this argument violates the most fundamental principle in estimation of the cost of capital: the cost of capital depends on the risk of the business in question. This is not a question of "fairness" -- it is a question of assessing objective evidence regarding how much risk investors bear. If telephone companies enter the cable business, their overall non-diversifiable risk will probably increase, as the relatively safe telephone business is blended with the much riskier cable business. The Commission then will have the task of separately analyzing the cost of capital for each business when setting telephone company returns. But there is no principled economic argument for a regulatory approach that equates the cost of capital for two businesses of different risk.

The remainder of this response is organized as follows. Section II addresses each of the criticisms raised by Dr. Vander Weide. Section III shows that Dr. Vander Weide's own recommendations reaffirm our recommended overall cost of capital of 13.0 percent when reasonable assumptions of the debt betas and a corrected embedded cost of debt are employed. Section IV concludes the reply statement.

II. DR. VANDER WEIDE'S CLAIMS ARE WITHOUT MERIT

In his affidavit, Dr. Vander Weide raises several objections to the methodology employed by Brattle to obtain a 13.0 percent recommended overall cost of capital for the cable industry. Generally, he claims the procedures Brattle employed result in an overstatement of the cost of equity and the overall cost of capital. Dr. Vander Weide purports to have

corrected these errors. In so doing, he obtained an overall cost of capital of 11.83 percent for a hypothetical 50-50 capital structure.[7]

The disparity between Dr. Vander Weide's estimate of 11.83 percent and Brattle's recommended cost of capital of 13.0 percent is largely driven by controversies over two issues: use of adjusted versus unadjusted betas and zero versus non-zero debt betas. The other areas of disagreement contribute less to the disparity between the estimates provided by the two parties. These other areas include disagreements over estimates of the cost of debt, the relationship between the cost of capital and the capital structure, the use of book versus market weights, and the choice of the risk-free rate.

This section addresses each of the points of controversy. We demonstrate that the beta adjustment Dr. Vander Weide recommends is invalid and that debt betas are positive. We show that Brattle's analysis of cable company cost of debt is correct and that in fact, Dr. Vander Weide's calculation of the embedded cost of debt is downward biased. Moreover, we explain that our assumption of a constant cost of capital, *i.e.*, independent of capital structure, is reasonable, that our use of market weights is correct -- it is textbook material, in fact -- and that Brattle's choice of the risk-free rate is consistent with the underlying theory whereas Dr. Vander Weide's is not.

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[7] The 11.83 percent overall rate of return is not Dr. Vander Weide's recommended cost of capital for the cable industry. At paragraph 18 of his affidavit, Dr. Vander Weide interprets this as "... a corrected version of Brattle's own ECAPM calculation." However, there are so many differences between the methodology underlying this number and Brattle's own recommendation of 13.0 percent that we cannot accept that characterization. Rather, we would characterize it as Dr. Vander Weide's ECAPM estimate, employing certain of Brattle's beta estimates and ECAPM formula.